

FORM PTO-1390
(REV 10-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

STGUP008

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/700530

INTERNATIONAL APPLICATION NO.
PCT/SE00/00522INTERNATIONAL FILING DATE
17-Mar-2000PRIORITY DATE CLAIMED
19-Mar-1999

TITLE OF INVENTION A DIGITAL CAMERA HAVING PANNING AND/OR TILTING FUNCTIONALITY AND AN
IMAGE ROTATING DEVICE FOR SUCH A CAMERA

APPLICANT(S) FOR DO/EO/US

Willy SAGEFALK and Lars ABRAHAMSSON

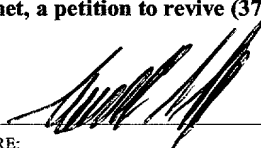
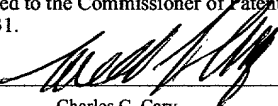
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).
4. ☐ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). Unsigned - 2 pages
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 1449 and # of cites: 4
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment. # of pages: 2
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

1-return receipt postcard

U.S. APPLICATION NO. (if known, see 37 CFR 1.53(a)) 097700530		INTERNATIONAL APPLICATION NO. PCT/SE00/00522		ATTORNEY'S DOCKET NUMBER STGUP008	
17. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO. \$860.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	3 -20 =	0	X \$ 18.00	\$ 0.00	
Independent claims	2 -3 =	0	X \$ 80.00	\$ 0.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$ 0.00	
TOTAL OF ABOVE CALCULATIONS =				\$ 1,000.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$ 0.00	
SUBTOTAL =				\$ 1,000.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 1,000.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED =				\$ 1,000.00	
				Amount to be refunded:	\$
				charged:	\$
a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>1,000.00</u> to cover the above fees is enclosed.					
b. <input type="checkbox"/> Please charge my Deposit Account No. <u>50-1338</u> in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed.					
c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>50-1338</u> .					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:					
Certificate of "Express Mailing"			Date: Nov 15, 2000		
Express Mail Label No.: EF051384256US			SIGNATURE: 		
I hereby certify that the attached fee and papers as indicated in this transmittal letter are being deposited with the U.S. Postal Service as "Express Mail Post Office To Addressee" service under 37 CFR 1.10 addressed to the Commissioner of Patents and Trademarks, Box PCT, Washington, D.C. 20231.			NAME: <u>Charles C. Cary</u>		
Date: Nov 15 2000 Signed: 			REGISTRATION NUMBER: <u>36,764</u>		
			Charles C. Cary		

528 Rec'd PCT/PTO 09/700530 15 NOV 2000

CERTIFICATE OF EXPRESS MAILING

I hereby certify that this paper and the documents and/or fees referred to as attached therein are being deposited with the United States Postal Service on November 15, 2000 in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR §1.10, Mailing Label Number EF051384256US, addressed to the Commissioner of Patents and Trademarks, Box PCT, Washington, DC 20231

Date: November 15, 2000

Signed: _____

Charles C. Cary

Patent

Attorney's Docket No. STGUP008

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)
SAGEFALK et al.) Examiner: n/a
Application No.: n/a) Group: n/a
Filed: November 15, 2000)
For: A DIGITAL CAMERA HAVING PANNING)
AND/OR TILTING FUNCTIONALITY AND)
AN IMAGE ROTATING DEVICE FOR)
SUCH A CAMERA)

PRELIMINARY AMENDMENT

Commissioner for Patents and Trademarks
Box PCT
Washington, D.C. 20231

Sir:

Before examination, please amend claims 1-3 in this application as follows.

IN THE CLAIMS:

1. (Amended) A digital camera [(300)] having panning and/or tilting functionality, comprising: a camera housing [(6)] with an optical input [(400)], such as a lens or objective [(8)]; an image capturing unit [(500)] for producing a digital image from light received through the optical input; a controller [(600)]; a first mirror [(9)] mounted externally to the camera housing [(6)] and an image rotating device [(200)], which is connected to the controller [(600)] and is adapted to rotate the first mirror at an angle of rotation with respect to the optical input [(400, 8)] of the camera housing [(6)], characterized by

an image transforming unit [(800)], which is connected to the image capturing unit [(500)] and is adapted to rotate the digital image, as captured by the image capturing unit [(500)], by an angle related to the angle of rotation of the first mirror [(9)].

2. (Amended) A digital camera as in claim 1, further comprising a second mirror [(10)] mounted externally to the camera housing [(6)], wherein the image rotating device [(200)] is adapted to rotate the second mirror at a second angle of rotation with respect to the optical input [(400, 8)] of the camera housing [(6)].

3. (Amended) An image rotating device [(200)] for a digital camera [(300)] having a camera housing [(6)], an optical input [(400)], such as a lens or objective [(8)], and an image capturing unit [(500)] for producing a digital image from light received through the optical input, the image rotating device comprising a first mirror [(9)] mounted externally to the camera housing [(6)], and a first rotational member [(5, 7)] for rotating the first mirror at a first angle of rotation with respect to the optical input [(400, 8)] of the camera housing, characterized by
a second mirror [(10)] mounted externally to the camera housing [(6)]; and
a second rotational member [(3, 7)] for rotating the second mirror at a second angle of rotation with respect to the optical input [(400, 8)] of the camera housing.

REMARKS

The claims have been amended to place the application in better form for examination.
Favorable consideration is respectfully solicited.

Respectfully submitted,
CARY & KELLY, LLP

Date: November 15, 2000

Signed: _____

Charles C. Cary
Registration No. 36,764

CARY & KELLY, LLP
1875 Charleston Road
Mountain View, California 94043
Telephone: 650.533.4844
Fax: 650.316.4013

1 528 Rec'd PCT/PTO 15 NOV 2000

A DIGITAL CAMERA HAVING PANNING AND/OR TILTING
FUNCTIONALITY, AND AN IMAGE ROTATING DEVICE FOR SUCH A
CAMERA

5 **Technical Field**

The present invention relates to a digital camera having panning and/or tilting functionality, and more specifically to a digital camera having a camera housing with an optical input, such as a lens or objective, an
10 image capturing unit and a controller. The invention also relates to an image rotating device for providing the panning and/or tilting functionality of such a digital camera.

15 **Background Art**

A common example of a digital camera with panning and/or tilting functionality is a web camera, which e.g. may be mounted at a given location for the purpose of surveillance, production monitoring, etc. The web camera
20 comprises an optical input in the form of a lens or objective and an image capturing unit for producing a digital image from light received from the optical input. Usually, the image capturing unit comprises a CCD element (Charge Coupled Device). The web camera has software and
25 hardware for allowing the camera to be connected to a given network, such as an Ethernet or Token Ring network. The web camera is arranged to produce digital images at a given rate, such as 1-25 images per second. In order to increase the visual volume covered by the web camera, the camera is
30 provided with mechanical means for panning and/or tilting the camera. Generally speaking, "panning" means rotating the camera by a given angle (normally 0°-360°) in a horizontal plane, and "tilting" means rotating the camera by a given angle (normally 0°-180°) in a vertical plane.

35 In prior art web cameras the panning and/or tilting functionality is obtained by moving the whole camera or at

least the objective thereof. Since the camera and objective have a considerable weight, such an approach involves complex, large and expensive mechanics. Furthermore, the speed at which the camera may be panned or tilted is restricted due to the large mass, that has to be moved accordingly.

Summary

It is an object of the present invention to provide a digital camera, which allows faster and more accurate panning and/or tilting, thereby allowing the camera to produce more images per time unit. Furthermore, it is an object of the present invention to provide an image rotating device, to be mounted externally to the digital camera, for providing efficient and rapid panning and/or tilting functionality, without requiring large or expensive mechanics.

The above objects are achieved by providing the digital camera with an image rotating device having a mirror mounted externally to the camera housing and having a rotational member for rotating the mirror with respect to the optical input (lens or objective) of the camera housing in response to an angular displacement control signal received from a controller of the digital camera.

Other objects, features and advantages of the present invention will appear from the following detailed disclosure, from the appended claims as well as from the drawings.

Brief Description of the Drawings

A preferred embodiment of the present invention will now be described in more detail, reference being made to the accompanying drawings, in which:

FIG 1 is a schematic block diagram of the overall structure of a digital camera according to the preferred embodiment,

FIG 2 is a first sideview of the image rotating device and the camera, to which it is mounted,

FIG 3 is a second sideview of the image rotating device and the camera shown in FIG 2, and

FIG 4 is a topview of the image rotating device shown in FIGs 2 and 3.

Detailed Disclosure

Referring to FIG 1, a digital camera 300 is illustrated in a basic modular form. The digital camera 300 is arranged to produce one or several digital image(s) of a generic object 100, which may be any physical object that is present in a volume optically covered by the digital camera 300. An inventive image rotating device 200 is mounted externally to the digital camera 300 in front of an optical input 400 of the digital camera. The optical input 400 is a generally known lens or objective. The purpose of the image rotating device 200 is to extend the available field of view of the digital camera 300 in at least one plane, preferably in a horizontal plane as well as in a vertical plane. A preferred embodiment of the image rotating device 200 will be described in more detail with reference to FIGs 2-4.

As shown in FIG 1, the digital camera 300 further comprises an image capturing unit 500, which is provided with appropriate means for producing a digital image representative of the object 100. Preferably, the image capturing unit 500 comprises a CCD element (Charge Coupled Device), the internal structure of which is believed to be well-known to a man skilled in the art. The digital camera 300 also has a controller 600 for controlling the image capturing unit 500 as well as the external image rotating

device 200. The controller 600 is operatively connected not only to the device 200 and the unit 500 but also to a digital memory 700 for storing images captured by the image capturing unit 500. Furthermore, the digital camera 300 may
5 comprise an image transforming unit 800, the purpose of which is to rotate the digital image to compensate for image rotating effects caused by the image rotating device 200, when the field of view is panned or tilted. The image transforming unit 800 is responsive to an angle of rotation
10 of the image rotating device 200 with respect to the objective 400 and uses this angle of rotation when transforming the digital image to compensate for the current pan and/or tilt angle. To perform such image transforming, i.e. to rotate a digital image in one or more than one direc-
15 tion, is believed to be well within reach of a man skilled in the art of digital cameras. Therefore, the internal structure of the image transforming unit 800 will not be described herein.

The memory 700 may be implemented by any commercially
20 available memory, such as an EEPROM memory.

As indicated in FIG 1, the digital camera 300 may be connected to a network 900, such as an Ethernet or Token Ring network, which in turn may be part of the Internet. In
25 such an application, the controller 600 of the digital camera 300 is provided with appropriate software for allowing the digital camera 300 to act as a web camera available on the network 900, i.e. a web server that produces digital images.

The pan and/or tilt angle of the digital camera 300,
30 or more specifically the angle(s) by which the image rotating device changes the field of view of the camera 300 with respect to a central axis of the objective 400, may be set and changed by a user of the camera by accessing the controller 600 through the network 900. Alternatively, the

pan and/or tilt angle(s) may be controlled from a computer directly connected to the digital camera 300.

A preferred embodiment of the image rotating device 200 will now be described in more detail with reference to
 5 FIGs 2-4. The following elements are shown in these drawings:

Qty	Ref. No.	Name
1	19	Frame
1	18	Timing belt tightener
1	17	Belt wheel
1	16	Timing belt
1	15	Belt wheel
1	14	Timing belt
1	13	Timing belt tightener
2	12	Optical sensor
1	11	Mirror holder
1	10	Tilting mirror
1	9	Fixed mirror
1	8	Camera lens (objective)
2	7	Motor
1	6	Camera housing
1	5	Mirror wheel
1	4	Bevel gear
1	3	Tilt shaft
2	2	Fixing part
1	1	Guiding wheel

The image rotating device 200 has a mirror system,
 10 comprising a first fixed mirror 9 and a second tilting mirror 10. The fixed mirror 9 is mounted directly in front of the objective 8 at an angle of 37° relative to the

optical center axis of the camera 300. The fixed mirror 9 is mounted to a mirror wheel 5, which is rotatable around the objective and hence provides a field of view with an angle of rotation of between 0° and 360° .

5 In the center of the field of view the tilting mirror 10 is mounted, so that the axis of rotation thereof is perpendicular to the optical center axis of the camera. The tilting mirror 10 is carried on the mirror wheel 5, thereby causing the tilting mirror 10 to rotate around the objective 8 together with the fixed mirror 9. Thanks to the geometrical arrangement of the mirrors 9 and 10 with respect to the objective 8, it is possible to monitor a large volume in a short time.

The tilting mirror 10 is attached to a mirror holder 15 11, which in turn is journaled in the mirror wheel 5 between two fixing parts 2. Opposite to the mirror wheel 5 a slightly smaller guiding wheel 1 is concentrically mounted. A tilt shaft 3 is eccentrically mounted to the mirror wheel, so as to cause the tilting mirror 10 to move. 20 The guiding wheel 1 transmits its motion to the tilt shaft 3 and from the tilt shaft 3 through a bevel gear 4 to the mirror holder 11. The arrangement resembles a planetary gear, where the guiding wheel represents a sun pinion and the tilt shaft represents a planet pinion. The mirror wheel 25 acts as holder of the planet pinion.

When the mirror wheel does not move, if the guiding wheel is rotated, the tilt shaft 3 will rotate around its own axis, wherein the mirror holder 11 will be rotated around its axis of rotation. Hence, the tilting mirror 10 30 is rotated with respect to the mirror wheel 5, and the center axis of the field of view will be angled with respect to the optical center of the camera. If the mirror wheel 5 and the guiding wheel 1 rotates at the same angular velocity, there will be no relative motion in the tilt 35 shaft and consequently no rotation of the mirror

holder/mirror around its axis of rotation. However, the mirror wheel 5 as a whole will rotate with the fixed mirror 9 and the tilting mirror 10 at a constant angle to the optical center axis of the camera.

5 In other words, by rotating the mirror wheel 5 and the guiding wheel 1 synchronously, the field of view may be rotated 360° for any given tilt angle. Then, if the wheels are rotated relative to each other, the angle of the mirror holder 11 will change, and the field of view may be again
10 be rotated 360° for a new tilt angle. In this way, a very large volume around the camera may be covered, and images may be obtained for any given location within this large volume.

The mirror wheel 5 and the guiding wheel 1 are driven
15 by respective motors 7. Belt wheels 15, 17, timing belts 14, 16 and timing belt tighteners 13, 18 are provided, as shown in FIGs 2-4.

The inventive image rotating device provides at least the following advantages:

- 20
- Low moment of inertia for rotating parts
 - High pan/tilt adjustment speed, short time between angular settings
 - High setting accuracy
 - Compact design

25

 - Few structural components
 - Low manufacturing cost
 - Flexible design
 - Simple pan/tilt control
 - Wide field of view

30 The present invention has been described above with reference to a preferred embodiment. However, other embodiments than the one disclosed herein are possible within the scope of the invention, as defined by the appended independent patent claims.

CLAIMS

1. A digital camera (300) having panning and/or tilting functionality, comprising: a camera housing (6) with an optical input (400), such as a lens or objective (8); an image capturing unit (500) for producing a digital image from light received through the optical input; a controller (600); a first mirror (9) mounted externally to the camera housing (6); and an image rotating device (200), which is connected to the controller (600) and is adapted to rotate the first mirror at an angle of rotation with respect to the optical input (400, 8) of the camera housing (6), **characterized by**

an image transforming unit (800), which is connected to the image capturing unit (500) and is adapted to rotate the digital image, as captured by the image capturing unit (500), by an angle related to the angle of rotation of the first mirror (9).

2. A digital camera as in claim 1, further comprising a second mirror (10) mounted externally to the camera housing (6), wherein the image rotating device (200) is adapted to rotate the second mirror at a second angle of rotation with respect to the optical input (400, 8) of the camera housing (6).

3. An image rotating device (200) for a digital camera (300) having a camera housing (6), an optical input (400), such as a lens or objective (8), and an image capturing unit (500) for producing a digital image from light received through the optical input, the image rotating device comprising a first mirror (9) mounted externally to the camera housing (6), and a first rotational member (5, 7) for rotating the first mirror at a first angle of

rotation with respect to the optical input (400, 8) of the camera housing, **characterized** by

a second mirror (10) mounted externally to the camera housing (6); and

- 5 a second rotational member (3, 7) for rotating the second mirror at a second angle of rotation with respect to the optical input (400, 8) of the camera housing.

11/11/2003 10:00:00 AM

ABSTRACT

A digital camera (300) has panning and/or tilting functionality and comprises: a camera housing (6) with an
5 optical input (400), such as a lens or objective (8); an
image capturing unit (500) for producing a digital image
from light received through the optical input; and a
controller (600). A first mirror (9) is mounted externally
to the camera housing (6). An image rotating device (200)
10 receives an angular displacement control signal from the
controller (600) and rotates the first mirror at an angle
with respect to the optical input (400, 8) of the camera
housing (6).

15

To be published together with FIG 1

1/4

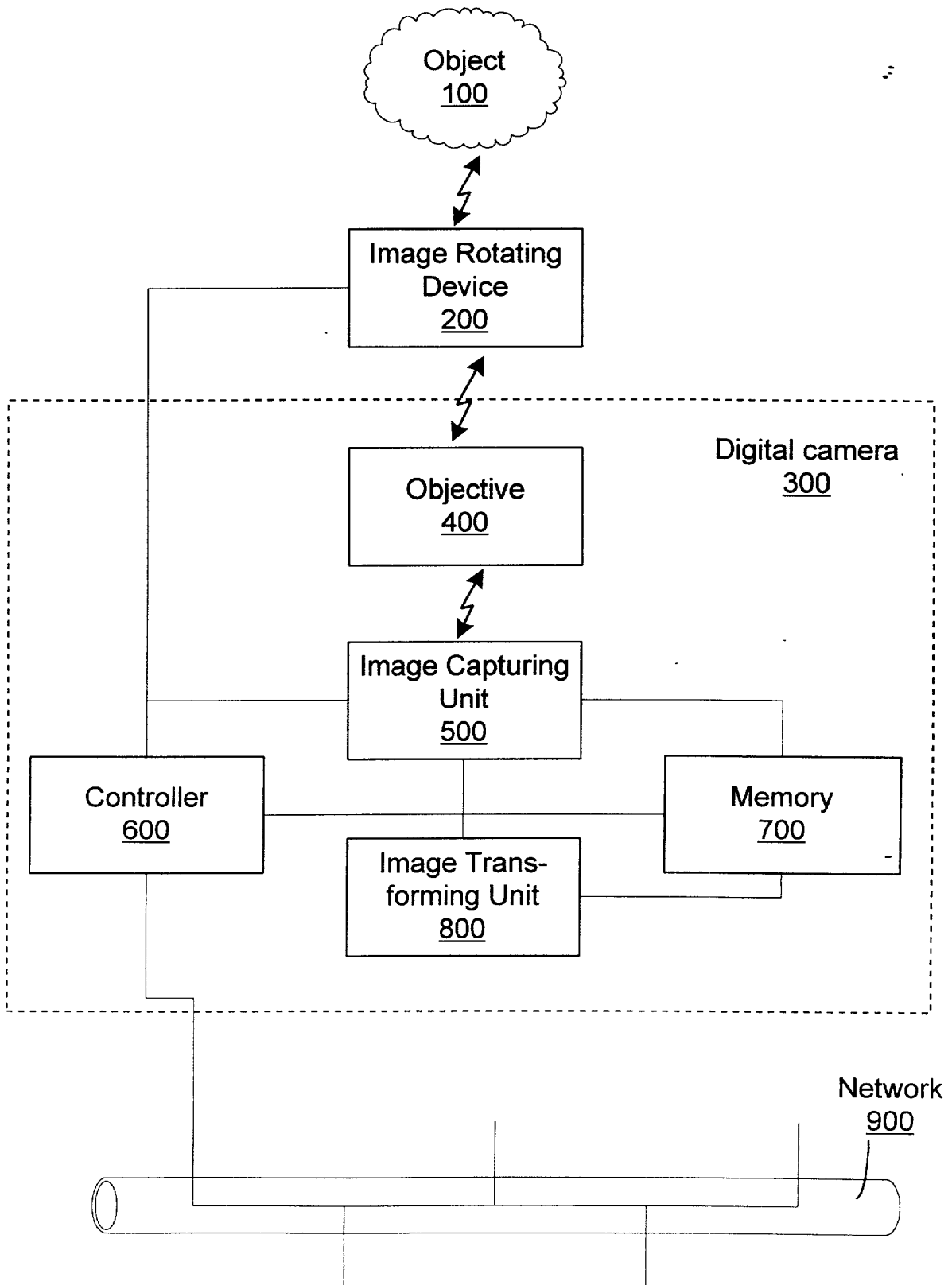


FIG 1

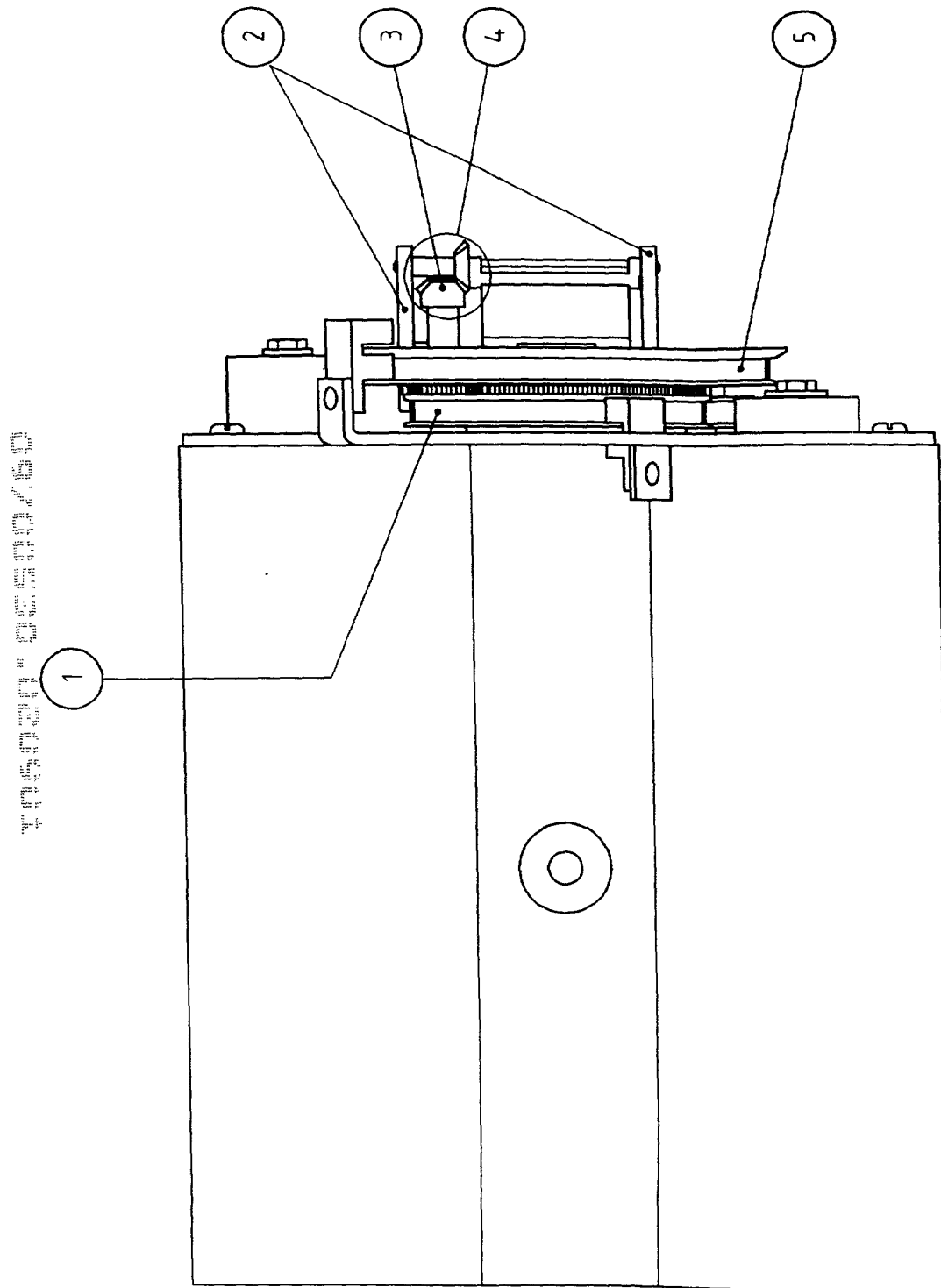


FIG 2

3/4

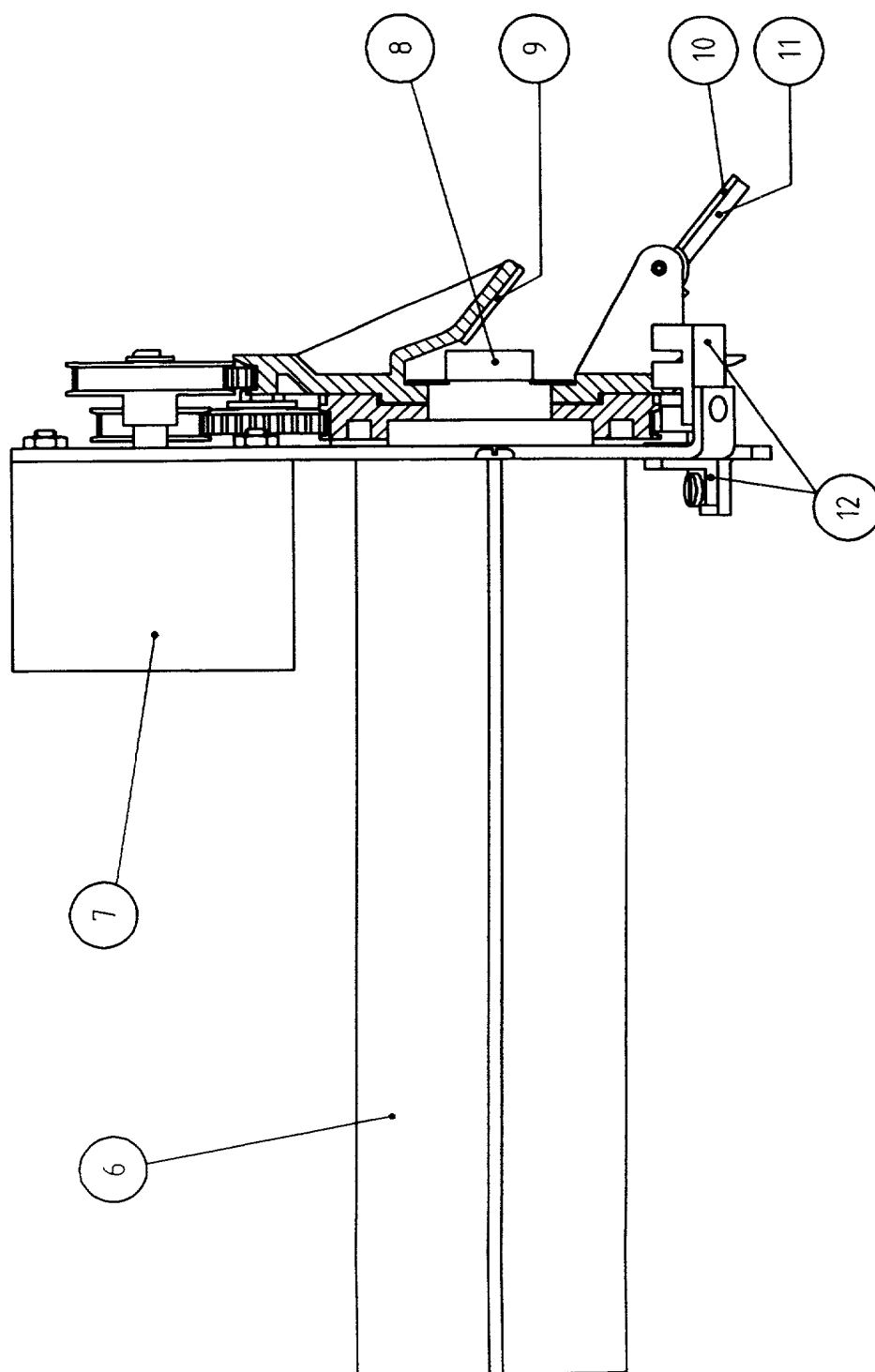


FIG 3

4/4

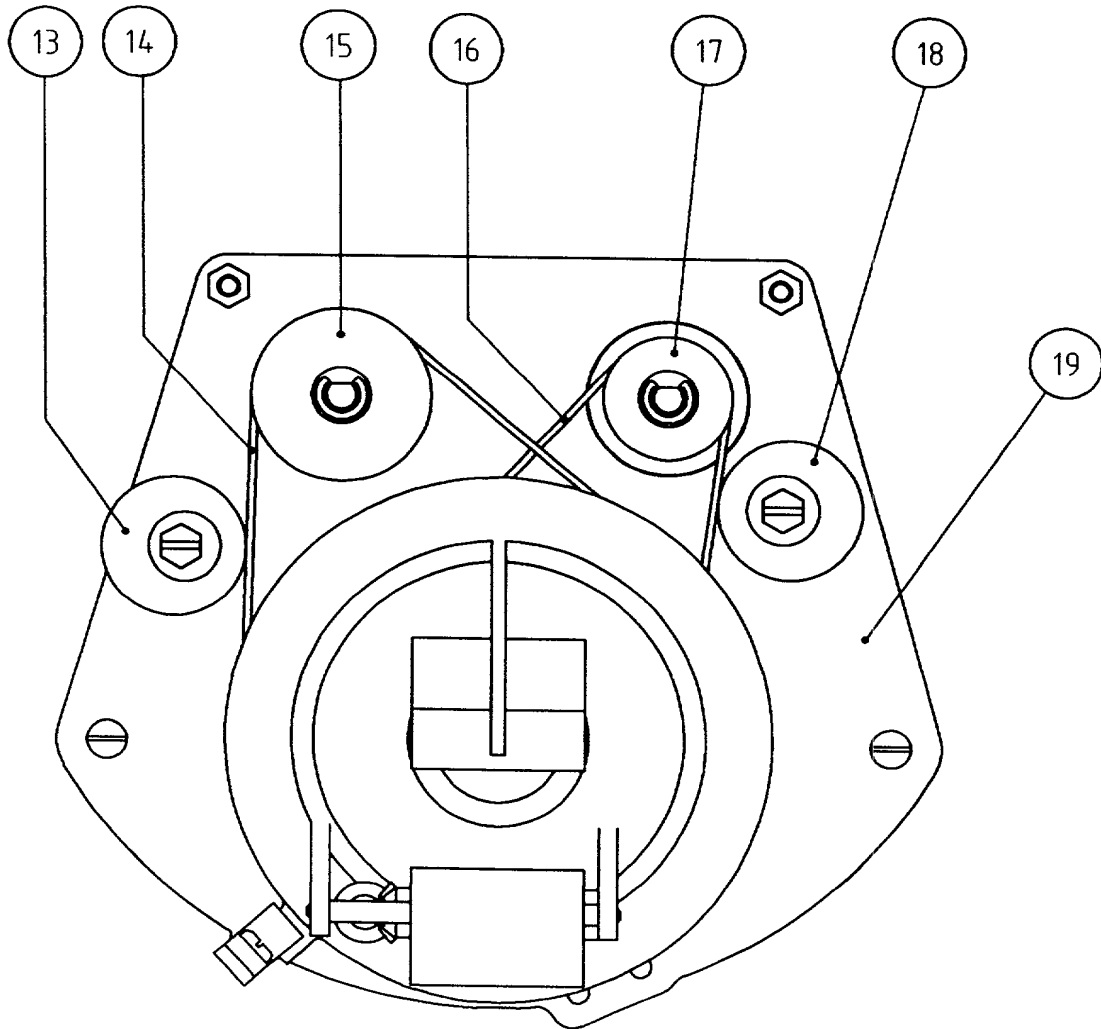


FIG 4

09 FEB 2001

DECLARATION AND POWER OF ATTORNEY FOR ORIGINAL U.S. PATENT APPLICATION

Attorney's Docket No. STGUP008



As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:
A DIGITAL CAMERA HAVING PANNING AND/OR TILTING FUNCTIONALITY AND AN IMAGE ROTATING DEVICE FOR SUCH A CAMERA the specification of which,

(check one)

1. ☐ is attached hereto.
2. ☒ was filed on November 15, 2000 as
U.S. Application No. 09/700,530
and was amended on _____.
3. ☐ was filed on _____ as
International PCT Application No. _____
and was amended on _____.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, CFR § 1.56.

I hereby grant my attorneys the right to insert the U.S. application number and filing date where space is provided above at any time subsequent to the date of my signature below.

Prior Foreign Application(s)

I hereby claim foreign priority benefits under Title 35, United States code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

			Priority Benefits Claimed?
			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<u>9901038-1</u>	<u>Sweden</u>	<u>March 19, 1999</u>	
(Application No.)	(Country)	(Filing Date)	
<u>PCT/SE00/00522</u>	<u>PCT</u>	<u>March 17, 2000</u>	
(Application No.)	(Country)	(Filing Date)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Provisional Application(s)

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

(Application No.) (Filing Date)

(Application No.) (Filing Date)

Atty. Dkt. No.: STGUP008

Page 1 of 2

Prior U.S. Application(s)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application No.) (Filing Date) (Status - patented, pending, abandoned)

(Application No.) (Filing Date) (Status - patented, pending, abandoned)

Power of Attorney

And I hereby appoint Charles C. Cary, Reg. No. 36,764 and Robert H. Kelly, Reg. No. 33,922, all of the law firm of **CARY & KELLY, LLP**, 1875 Charleston Road, Mountain View, California, 94043, and all practitioners who are associated with this firm as my principal attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Direct Correspondence To:

CARY & KELLY, LLP
1875 Charleston Road
Mountain View CA, 94043

Direct Telephone Calls To:

Charles C. Cary at telephone number (650) 533.4844

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1-10
Typewritten Full Name of
Sole or First Inventor:

Willy SAGEFALK

Citizenship: Sweden

Inventor's signature:



Date of Signature: 010105

Residence: (City)

Lund

(State/Country) Sweden

Post Office Address:

Mollevangsvagen 8, S-222 40, Lund, Sweden

SEY

2-10
Full Name of Second Joint
Inventor (if any):

Lars ABRAHAMSSON

Citizenship: Sweden

Inventor's signature:



Date of Signature: 010105

Residence: (City)

Linköping

(State/Country) Sweden

Post Office Address:

Vidagatan 1B, S-582 46, Linköping, Sweden

SEY